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Yu GAO
University of Chicago

Yiu Kuen TSE
Singapore Management University, yktse@smu.edu.sg

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**Market Segmentation and Information Values of
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**Y Gao
Y K Tse**

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Market segmentation and information values of earnings announcements: Some empirical evidence from an event study on the Chinese stock market

Y. Gao
Graduate School of Business
University of Chicago
Chicago, IL 60637

and

Y.K. Tse
School of Economics and Social Sciences
Singapore Management University
Singapore 259756

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Abstract: This paper investigates the trading activities of two distinct classes of shareholders, namely, the Chinese domestic investors and the foreign investors in the segmented Chinese A-share and B-share markets, respectively. We conduct an event study on the annual earnings announcements based on two different accounting standards: IAS and PRC GAAP. The earnings announcements based on IAS and PRC GAAP are value relevant. The investors in the B-share market react to both the IAS and PRC GAAP earnings announcements, while the investors in the A-share market pay more attention to the PRC GAAP earnings reports. In the B-share market, positive abnormal returns are associated with positive earnings surprise and negative abnormal returns go with negative earnings surprise. We find pre-event abnormal trading volumes without significant price changes for the A shares, which may be due to existing information in the A-share market prior to earnings announcements. The post-event abnormal trading volumes last for a longer period in the A-share market than in the B-share market.

JEL classification: G14; G15

Keywords: Earnings announcement; Event study; Market segmentation

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Corresponding author: Y.K. Tse, School of Economics and Social Sciences, Singapore Management University, 469 Bukit Timah Road, Singapore 259756; Tel: +65-6822-0257; Fax: +65-6822-0833; email: yktse@smu.edu.sg

1. Introduction

An important move in China's (People's Republic of China (PRC)) economic reform is to reactivate the stock exchanges after four decades of abandonment. Accompanied by regulatory reforms, a move to partially privatize state-run enterprises appeared. The government selected some state-owned plants and restructured them to form new firms as parts of the original enterprises. These firms were then listed on one of the two exchanges, namely, the Shanghai Stock Exchange (SHSE) and the Shenzhen Stock Exchange (SZSE), where two types of shares are listed: A shares, which are issued strictly to the PRC citizens, and B shares, which are issued only to foreigners. Cross listing between the two exchanges is not allowed. A firm may issue state shares, legal-entity shares, A shares and B shares. However, only A shares and B shares are issued to the public and traded in the market. Xu (2000) provided an account of the microstructure of the Chinese stock market. Fung and Leung (2001) discussed the legal aspects and the corporate-governance issues of the Chinese financial markets.

The A- and B-share markets are rigidly segmented, causing high price premiums of the A shares relative to the corresponding B shares, although the owners of the A- and B-shares have the same rights. International accounting standards (IAS) are used to prepare accounting reports for the B-share holders, while China's accounting regulations (PRC generally accepted accounting principles (PRC GAAP)) are used to prepare accounting reports for the A-share holders.

Most empirical works on the segmentation of the Chinese stock market compare the behavior of the A shares and B shares using regression and correlation analysis. For example, Chui and Kwok (1998) examined the cross correlation of the returns in the A- and B-share markets. Their correlation analysis showed that the returns in the B-share market lead the returns in the A-share market. Fung, Lee and Leung (2000) used a latent variable model to examine the pricing of the A and B shares. They argued that the pricing of the two markets reflects different fundamental forces. Xu (2000) analyzed the time series return and volatility patterns of the Shanghai market. Using cointegration analysis, Chan, Cheng and Fung (2001) concluded that the A- and B-share prices do not follow the same dynamics. Overall, these results suggest that there is a difference in the price dynamics of the two markets, but there is also relevant information flow between the two markets. It will be interesting to go deeper at the micro level to examine if there is any difference in the reaction of each market to news and information.

In this paper we adopt the event study methodology and focus on the differential reactions of the A- and B-share investors to earnings announcements.¹ We compare the behavior of the price reaction of the A shares and B shares in response to the companies' earnings announcements under different accounting standards. While trading volume has generally been ignored in previous research as an indicator of differential market behavior, in this paper we investigate the trading volumes of the A shares and B shares in reaction to the earnings announcements. As shown by He and Wang (1995), trading volumes around earnings-announcement dates have important implications for the information values of earnings announcements.

Our event study on the effects of annual earnings announcements based on PRC GAAP and IAS on the A- and B-share markets shows that there are prominent abnormal returns and trading volumes during the windows of earnings announcements, which is consistent with

¹ To the best of our knowledge, Poon, Firth and Fung (1998) is the only paper in the literature that uses an event study to examine the segmentation of the Chinese stock market. The "event" in Poon et al. is the initial listing of the B shares. As forcefully argued by Fama (1991), an event study allows a researcher to examine the market in a microscopic manner and is insensitive to model misspecification that may affect a regression model.

previous results that earnings information is value relevant in the Chinese stock market. The abnormal trading volumes in the A-share market persist for a longer period than those in the B-share market, which supports the findings of Su and Fleisher (1999), who reported that “news is more persistent for the A-shares than for the B-shares”. The pre-event abnormal trading volumes without significant price changes for the A shares may be due to some pre-event existing information in the A-share market. Using the earnings numbers based on PRC GAAP, we find significantly positive abnormal returns in the good-news event window and significantly negative abnormal returns in the bad-news event window for both the A- and B-shares. With the earnings compiled under IAS, however, we find only significantly positive abnormal returns in the good-news event window and significantly negative abnormal returns in the bad-news event window in the B-share market. In the A-share market significantly negative abnormal returns are observed in the bad-news window but we find no significantly positive abnormal returns on the good-news event day. This result suggests that the Chinese investors are not much concerned about the accounting information based on IAS. This agrees with Chen, Firth and Kim (2002), who reported that IAS earnings are value relevant to B shares, while investors in the A-share market put most weight on PRC GAAP.

The rest of this paper is organized as follows. Section 2 provides a survey of the Chinese stock market. Section 3 reviews the relevant literature on trading and information, and outlines the hypotheses to be examined in the event study. Section 4 presents the methodology and describes the data. Section 5 reports the results and the interpretation. Section 6 summarizes and concludes.

2. The Chinese Stock Market and Accounting Practices

2.1 The Shanghai Stock Exchange and Shenzhen Stock Exchange

There are two official national exchanges in China, namely, the SHSE established on December 19, 1990, and the SZSE founded on July 3, 1991. In the past ten years, the size of the two exchanges expanded rapidly. At the end of 2000, there were 572 and 514 firms listed on the SHSE and SZSE, respectively.

From 1992, the Chinese government allowed a selected list of firms to issue tradable shares to foreign investors, which are called B shares so as to distinguish them from those issued only to the PRC citizens. Although the B shares are also listed on the two domestic exchanges, they are denominated in US dollars on the SHSE and in Hong Kong dollars on the SZSE. At the end of 2000, 559 A shares and 55 B shares were listed on the SHSE, and 499 A shares and 59 B shares were listed on the SZSE.

2.2 Market Segmentation

Like many developing countries, China set up legal restrictions on the foreign ownership of domestic equity in order to maintain the control over local firms, especially those companies that are of strategic and national importance. A major reason for this arrangement is to attract foreign funds without worrying about the loss of ownership control. Thus, in China a local firm may issue two different types of shares, namely, A shares and B shares. Foreign investors are only allowed to hold the B shares but not the A shares. On the other hand, Chinese citizens cannot buy foreign currencies freely. Thus, the local people have little chance to invest in the foreign stock markets. The lack of investment alternatives is a possible reason for the price premium of the A shares relative to the B shares.

A unique feature of the Chinese stock market is that the markets for the A shares and B shares are completely segmented during our period of study,² while the segmentation in most other markets are only partial. In the latter case, foreign investors are allowed to own only the foreign class of shares, while domestic investors can own both local and foreign shares. Thus, the stock market in China was completely segmented, although the owners of the A shares and B shares have equal rights.

The contrast between the scale and transaction in the A-share and B-share markets is very clear: the number of listed firms, stocks, and issued shares, the market capitalization, the trading volume, the deal number, and the turnover of the A shares are much larger than those of the B shares. At the end of 2000, there were 29.433 million A-share accounts and 0.145 million B-share accounts on the SHSE. On the SZSE, the figures were 28.303 million and 0.129 million for the A-share and B-share accounts, respectively. In the A-share market, individual investors dominate, while in the B-share market the percentage of institutional investors is much higher than that in the A-share market.³

2.3 Accounting Practices

The companies that issued B shares need to prepare two sets of financial statements, one is based on IAS for the B-share holders, and the other is based on PRC GAAP for the A-share holders. The PRC GAAP and IAS numbers are released to the share holders on the same day. The level of disclosure is higher for the B shares than for the A shares, and the IAS are more conservative than the PRC GAAP.⁴ Thus, the profit numbers, asset numbers, and book values differ between the IAS and PRC GAAP statements. The differences between the two sets of numbers are disclosed in the PRC GAAP statements, and the B-share annual reports include the A-share accounts as supplementary information. Thus, there are no barriers to the A-share holders to access the data from the IAS financial reports. Likewise, the B-share holders can access the data from the PRC GAAP reports. Hence, it is possible to use both the PRC GAAP and IAS data to make investment decisions.

3. Literature Review and Formulation of Hypotheses

In this section we first review the literature on the effects of information on stock trading, followed by a brief survey of related empirical research on the Chinese stock market.

3.1 The Effects of Information on Trading

Beaver (1968) investigated the reaction of stock price and volume to earnings announcements. He argued that abnormal trading volumes reflect the degree to which individual investors in the market revise their expectations in reaction to earnings announcements, and abnormal returns reflect the aggregate or average revision in expectations. Bamber (1986) demonstrated that earnings announcements are informative about firm prospects. Kim and Verrecchia (1991a) developed an analytical framework to show that when traders have different beliefs, the level of differential pre-disclosure precision

² On February 19, 2001, the China Securities Regulatory Commission announced that Chinese citizens are allowed to hold and trade B shares. However, our study period does not extend to this date.

³ At the end of 2000 the SHSE institutional investors held 0.41% of the market value of the A shares, while in the B-share market the institutional investors owned 5.52% of the market value. On the SZSE, the figures were 0.49% and 3.02% in the A- and B-share markets, respectively.

⁴ Major differences between PRC GAAP and IAS are summarized by Bao and Chow (1999).

of information is related to the change in trading volume in response to public disclosure of information. Ziebart (1990) and Ajinkya, Atiase and Gift (1991) explained the variations in trading volumes in terms of pre-disclosure asymmetry. Bamber (1986, 1987), Holthausen and Verrecchia (1990), Ziebart (1990), Terpstra and Fan (1993), Kross, Ha and Heflin (1994), Atiase and Bamber (1994) explained the variations in the trading volume in terms of unexpected earnings, firm size, risk changes, market-wide volume influences and the magnitude of associated price reaction. Kandel and Pearson (1995) suggested a model based on differential interpretation around public announcements. They demonstrated that abnormal trading volume may occur even when the announcements do not produce value effects.

Recently, He and Wang (1995) constructed a dynamic model of differential information and behavior of stock trading to incorporate the empirical findings in the literature. The main results are: (i) Private information does not only cause trading in the current period, but also generates possible trading afterwards; (ii) Public information leads to trading in the current period and high volume appears around the announcement date; and (iii) New information, private or public, brings about high volume accompanied by large price changes while existing information only generates high volume without large price changes.

There has been some empirical research on specific markets. Terpstra and Fan (1993) analyzed forecasts of Hong Kong firms' earnings and gave additional support for the trading-volume theory that investor disagreement over the interpretation of information leads to increased trading. Chung and Lee (1998) studied the Japanese stock market and investigated the differential trading activities exhibited by different types of investors in response to earnings announcements. Choi and Choe (1998) provided empirical evidence for the effect of annual earnings announcements on investors' trading volume in the Korean stock market.

In an event study, Bhattacharya, Daouk, Jorgenson, and Kehr (2000) investigated a sample of Mexican corporate news announcements and found that there are no unusual reactions in returns, volatility of returns, volumes of trade and bid-ask spreads around news announcements. They attributed such a "curious case" to the "unrestricted insider trading" and argued that ranking emerging stock markets in terms of their market integrity is a methodology that can be used with the limited data available in these markets. This argument shows that extending the research to other emerging stock markets such as the Chinese stock market is of particular importance.

3.2 Selected Empirical Literature on the Chinese Stock Market

Earlier empirical research on the Chinese stock market has focused on the correlation structure of the A shares versus the B shares, and the puzzle that the A shares are traded at a high premium versus the B shares (Bailey (1994); Ma (1996); Sun and Tong (1998); Bailey, Chung and Kang (1999); Poon, Firth and Fung (1998); Su and Fleisher (1999)).

Recently, the relevance of accounting information based on different accounting standards (IAS and PRC GAAP) for the stock prices in the Chinese stock market has been extensively studied. One line of research is to examine the role of earnings in the valuation of listed companies (Chen, Chen and Su, 2001; Haw, Qi and Wu, 1999). The empirical results suggest that the earnings reported under PRC GAAP are value relevant to the Chinese investors. Another direction is to compare the degrees of value relevance of earnings compiled under PRC GAAP and IAS (Bao and Chow, 1999; Chen, Firth and Kim, 2002). Bao and Chow (1999) found that the earnings based on PRC GAAP and IAS are both significantly associated with the B-share prices, but accounting information based on IAS has greater information contents for B shares than that based on PRC GAAP. Chen, Firth and Kim (2002) reported that IAS earnings are value relevant to B-share prices and returns, while

investors in the A-share market put more weight on PRC GAAP. It is only until recently that the A-share investors started to pay attention to the information based on IAS.

3.3 Annual Earnings, Concurrently Announced Cash Dividends and Stock Dividends

Annual earnings, cash dividends, and stock dividends are usually announced concurrently in China. To conduct an event study on annual earnings announcements, we need to disentangle other noisy effects. Haw, Qi and Wu (2000) studied the Chinese A-share market and found that good-news firms tend to release their reports earlier than the bad-news firms. Chen, Firth and Gao (2002) reported that unexpected earnings announcements have an impact on stock prices, that the earnings signal is stronger (or weaker) when the earnings surprise is corroborated (or diluted) by a stock dividend surprise of the same (or opposite) direction, and that unexpected cash dividends have little impact on the earnings signal. In our study of earnings announcements, we check the unexpected stock dividends and exclude the announcements from the sample when the earnings and stock dividends change in opposite directions. Thus, in event i , if the earnings surprise is positive (or negative), but the corresponding stock dividend per-share is less (or more) than the dividend per-share announced in the previous year's financial report, the event is deleted from the sample.

3.4 Some Hypotheses

In this section we formulate some hypotheses to be examined in the event study.

(1) Are the trading volumes in the announcement period accompanied by large price changes?

He and Wang (1995) showed that volume may lag behind the information flow when the information is private. They demonstrated that “exogenous information”, which includes new private signals and public announcements, generates trading together with large price changes, while volume generated by existing private information is not accompanied by significant price changes. As defined by He and Wang, earnings announcement is exogenous. Thus, we would expect to see high volume surrounding the news release accompanied by significant abnormal returns in both the A- and B-share markets.

(2) Will the investors react to both the IAS and PRC GAAP earnings announcements?

As indicated in Chen, Firth and Kim (2002), IAS earnings information is closely related to the prices and returns of B shares and PRC GAAP earnings information does not bring *incremental* information to the B-share investors. Lev (1988) argued that accounting information has different values to different classes of investors. Kim and Verrecchia (1991a, 1991b) provided a theoretical model to support Lev's argument. Cready (1988) reported that large (institutional) investors are more responsive to earnings announcements than small (individual) investors. Since most B-share investors are large international financial institutions and foreign investors find it more difficult to acquire local information, they tend to focus on and utilize the accounting reports. These arguments constitute the intuition for the following hypothesis:

H₁: Foreign investors react to both the IAS and PRC GAAP earnings announcements.

Chen, Firth and Kim (2002) found that Chinese investors put more weight on PRC GAAP earnings and started to use the IAS earnings information only recently. Thus, we set up the second hypothesis as follows:

H₂: Chinese investors react to the PRC GAAP earnings announcements, and, to a less extent, the IAS earnings information.

(3) Does publicly released news based on different accounting standards have any predictable effects on the A- and B-share markets?

Publicly released news may generate market reaction. How the markets respond to different news is an interesting question. We examine the effects of good and bad news on the segmented markets and establish the following hypotheses:

H₃: Good news generates positive abnormal returns on announcement dates in both the A- and B-share markets.

H₄: Bad news generates negative abnormal returns on announcement dates in both the A- and B-share markets.

4. Data and Methodology

4.1 The Data

The period under study is from June 1995 through May 2000. The Appendix provides the list of selected companies from SHSE and SZSE. Several criteria were used to screen the data. The first step is to select the stocks. We pick the firms that have listings in both A shares and B shares. In the SHSE we obtain 41 firms, while in the SZSE the number is 42. Among these, one firm on the SHSE and 21 firms on the SZSE are followed by fewer than three analysts from the International Brokers Estimate System (IBES). These firms are screened out. The last requirement for the remaining 40 firms on the SHSE and 21 firms on the SZSE is that their stocks should be traded in the market for at least one year. Finally, 112 annual earnings announcements from 38 firms on the SHSE and 44 annual earnings announcements from 21 firms on the SZSE survive the screening.

We conduct our study on two different reporting standards, namely, IAS and PRC GAAP. The sample sizes under different criteria of earnings surprise based on the two accounting standards are summarized in Table 1.

Daily stock prices, trading volumes, market indices, the forecast of earnings and number of analysts from IBES were collected from the Datastream.⁵ Actual earnings and dividend information were obtained from the annual reports of the companies. Dates of announcements were gathered from the SHSE and SZSE.⁶

⁵ In China there are no official earnings forecast reports. We use the earnings forecasts by IBES, an institution well-known for the US firms. The firms in our sample are studied by at least 3 analysts during the examination period. Ang and Ma (1999) measured the transparency of the Chinese capital market by means of the individual analysts' forecasts. They argued that although the errors of analysts' forecasts for the Chinese stocks are much higher than those for Hong Kong and other Asia Pacific stocks, the forecasts are still of value.

⁶ The dates of the announcements were collected from the official websites of the SHSE (www.sse.com.cn) and SZSE (www.sse.org.cn). Both websites are authorized by the Chinese Securities Regulation Commission (CSRC). We also cross-checked the report dates against the *China Securities*, *Shanghai Securities* and *Securities Times*, which are authorized financial newspapers in China.

4.2 The Methodology

Classic event-study methodology is applied to examine the information contents of earnings-per-share announcements. The announcement date is defined as day 0, and the estimation period is from day -150 to day -21 . The total estimation period covers 130 trading days. The event window of interest begins from day -20 and ends on day $+10$.

Let R_{it} denote the return of a security represented as the i th event on day t . Using the continuously compounding method, R_{it} is calculated as (dividend is included when it is distributed):

$$R_{it} = \ln P_{it} - \ln P_{i,t-1} \quad (1)$$

where P_{it} is the security price in the i th event on day t . We follow Brown and Warner (1985) and calculate the abnormal daily return using three different measures: mean adjusted, market adjusted and market-model adjusted.

Let A_{it} denote the excess (abnormal) return of the security in the i th event on day t . The daily excess return in the event window is calculated using the following three methods: (1) mean-adjusted return, $A_{it} = R_{it} - \bar{R}_i$, where \bar{R}_i is the arithmetic average of the security's daily returns in the $(-150, -21)$ estimation period of the i th event, (2) market-adjusted return, $A_{it} = R_{it} - R_{mt}$, where R_{mt} is the return of the index on day t , and (3) market-model-adjusted return, $A_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}$, where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are obtained using ordinary least squares.

The index return in each segmented stock market is used to proxy the market return. We adopt the returns of the Shanghai A-share stock index, the Shanghai B-share stock index, the Shenzhen A-share stock index, and the Shenzhen B-share stock index to represent the market returns of the Shanghai A-share, the Shanghai B-share, the Shenzhen A-share and the Shenzhen B-share markets, respectively. These indices are all value-weighted. The index return R_{mt} is also computed using the continuously compounding measure, i.e.,

$$R_{mt} = \ln P_{mt} - \ln P_{m,t-1} \quad (2)$$

where P_{mt} is the market index on day t .

We consider the abnormal returns and calculate both the parametric t -statistic and the non-parametric Corrado (1989) rank statistic. However, as the results for the two approaches are qualitatively similar, we only report the results for the parametric t -test. The daily cross-sectional average excess return of all the securities in the N events, namely A_t , is calculated as:

$$A_t = \frac{1}{N} \sum_{i=1}^N A_{it} \quad (3)$$

and the t -statistic for A_t is computed as:

$$T_t = A_t / S(A) \quad (4)$$

where $S(A)$ is the standard deviation of the abnormal return in the estimation window defined as:

$$S(A) = \sqrt{\frac{1}{129} \sum_{t=-150}^{-21} A_t^2} \quad (5)$$

To differentiate the markets' reaction to different information, we classify the annual earnings announcements into good news and bad news. Using the annual earnings numbers based on IAS and the earnings forecasts data collected from IBES, we define and calculate the earnings surprise according to the following formula:

$$ES_i = (AE_i - EE_i) / |EE_i| \quad (6)$$

where AE_i is the actual earnings based on IAS in the i th event and EE_i is the estimated earnings reported by IBES. Since the IBES earnings forecasts are for the B shares and there are no official earnings forecasts for the A shares, we use another formula to calculate the earnings surprise when the annual earnings numbers are based on PRC GAAP, i.e.,

$$ES_i = (AE_{it} - AE_{i,t-1}) / |AE_{i,t-1}| \quad (7)$$

where $AE_{i,t}$ is the actual annual earnings based on PRC GAAP reported in the i th event and $AE_{i,t-1}$ is the previous year's annual earnings based on PRC GAAP for that company. To screen out the good news, we try two different thresholds. Good earnings surprise is defined as ES_i above 0% and 20%. Similarly, for the bad news, the two standards are set as earnings surprise below 0% and -20%. However, the results for the two thresholds are quite similar, and we shall only report the results of good news defined by $ES_i > 20\%$ and bad news defined by $ES_i < -20\%$.

To examine the changes in the trading volume upon earnings announcements, abnormal daily trading volume is calculated as the difference between the trading volume and the mean daily volume of that stock over the event period normalized by the standard deviation. Each stock's daily trading volume is the turnover as measured by the number of shares. Following Brown and Warner (1985) and Corrado (1989), a t -test is applied to examine the significance of the normalized abnormal trading volume in the event window. Specifically, we define EV_{it} as the excess trading volume of the security in the i th event on day t , i.e.,

$$EV_{it} = V_{it} - \bar{V}_i \quad (8)$$

where V_{it} is the volume of the i th event on day t and \bar{V}_i is the simple average of the security's trading volume of the i th event during the $(-150, -21)$ estimation period. The standard-deviation-normalized abnormal volume, E_{it} , is calculated as:

$$E_{it} = EV_{it} / S(EV_i) \quad (9)$$

where $S(EV_i)$ is its estimated standard deviation given by:

$$S(EV_i) = \sqrt{\frac{1}{130} \sum_{t=-150}^{-21} EV_{it}^2} \quad (10)$$

For each day t , the cross-sectional average abnormal (excess) volume of all the events, E_t , is computed as:

$$E_t = \frac{1}{N} \sum_{i=1}^N E_{it} \quad (11)$$

and the t -statistic for day t is obtained by

$$T_t = \frac{1}{\sqrt{N}} \sum_{i=1}^N E_{it} \quad (12)$$

This test statistic depends on the cross-section independence of the securities' excess volume for correct specification. Brown and Warner (1985) showed that the test has good power when the independence assumption holds.

5. Empirical Results

5.1 Abnormal Returns and Abnormal Trading Volumes

Tables 2 and 3 present the abnormal returns and abnormal trading volumes in the event windows of good and bad news, respectively, based on IAS earnings announcements. Likewise, Tables 4 and 5 report the results for the PRC GAAP earnings announcements. As the results for the three methods of calculating the abnormal returns described in Section 4.2 are very similar, to save space we only report the results for the market-model-adjusted abnormal returns. Using a one-tail test at the 5% level of significance, we highlight the significant t -statistics in bold face. It can be seen that there are more cases of significant abnormal returns in the A-share market compared to the B-share market. The latter, however, has a very clear-cut pattern in that the B-share prices react positively to good news and negatively to bad news, for both the IAS and PRC GAAP reports. Furthermore, the reaction occurred mostly on the event day. On the other hand, the reactions in the A-share market appear to be rather unsystematic. We shall return to this point later.

For the trading volume, we find significant patterns around the earnings-announcement dates. There are significant positive abnormal trading volumes around the announcement dates, reflecting the nature of earnings announcements as “exogenous information” described by He and Wang (1995). This is true for both the A- and B-share markets. We can see that in the A-share market, large abnormal trading volumes without relevant price changes appear in the event windows of both good and bad earnings announcements. The abnormal trading volume may become prominent even two or three weeks before the announcement. According to the findings of He and Wang (1995), this may imply some existing information in the A-share market. There are considerable post-event reactions up to day +5 for the B-share market. In comparison, the post-event reactions in the A-share market extend up to day +10. The abnormal trading volumes persist for a longer period for the A shares than for the B shares. Also, the abnormal trading volume measure is generally larger for the A-share market than the B-share market in the announcement window. For the A-share market, abnormal

volume is more prominent when surprises are based on PRC GAAP, whether they are good or bad surprises.

5.2 Good News versus Bad News

5.2.1 Good News

From Table 2 we can see that abnormal returns are significant on days -8 , -1 , $+2$ and $+4$ for the A shares, and on day 0 for the B shares, when earnings surprises are based on IAS. When we further consider the abnormal return values, we find that the abnormal returns are positive in the B-share market but negative in the A-share market on the event day as well as the subsequent two days. An explanation for this phenomenon may be that the good news defined here actually is *not good* to the Chinese investors. As we use the IBES forecast data that are offered by the foreign institutional brokers and the foreign investors' estimate may not represent the local investors' forecast. We try the naïve forecast measure as an alternative: we replace the IBES forecast value with last year's IAS earnings. However, we still get similar reaction patterns in both the A- and B-share markets.

In Table 4 abnormal returns are significant on days 0, $+2$ and $+5$ for the A shares, and on days 0 and $+6$ for the B shares, when earnings surprises are based on PRC GAAP. The event-day abnormal returns are positive for both the A- and B-share markets. For the A-share market, the abnormal returns are positive for days 0 and $+1$, with reversal appearing in the subsequent three days. Thus, when PRC GAAP earnings are used, the anomaly of the A-share returns reacting negatively to good-news surprises is eliminated.

Overall, the evidence seems to support hypothesis H_3 for the B shares. In particular, the good-earnings information based on IAS and PRC GAAP can both be used as signals in the B-share market. For the A-share market, however, stock returns do not move in line with the positive IAS earnings information. Instead, Chinese investors are more likely to react only to positive PRC GAAP annual earnings information.

5.2.2 Bad News

From Table 3 we can see that abnormal returns are significant on days -4 , 0, $+4$ and $+6$ for the A shares, and on day 0, $+1$ and $+2$ for the B shares, when surprises are based on IAS. The abnormal returns are negative in both markets, which is consistent with the bad-news effects found in other stock markets. In Table 5 significantly negative abnormal returns are found on days -4 and 0 in the A-share stock market, and on days 0 and $+3$ in the B-share market, when surprises are based on PRC GAAP.

Thus, hypothesis H_4 is supported for both the A shares and B shares. The negative earnings information based on IAS and PRC GAAP have information values for the A- and B-share markets. Indeed, in the A-share market the prices react drastically on bad-news announcements, as demonstrated by the magnitude of the drop on the event day. In comparison, the B-share market reacts rather mildly to bad-news announcements.

5.3 IAS versus PRC GAAP

The analysis of the effects of good and bad news based on IAS and PRC GAAP shows that the investors in the B-share market react to both the IAS earnings and PRC GAAP earnings information, which is consistent with the findings by Bao and Chow (1999), who found that earnings based on PRC GAAP and IAS are both significantly associated with the B share prices. Our event-study results thus support hypothesis H_1 .

The A shares react significantly to the earnings announcements based on PRC GAAP. Although significantly negative abnormal returns of the A shares appear on the event day of negative earnings surprise based on IAS, the abnormal returns in the A-share market are not significant on the event day of positive earnings surprise based on the IAS financial reports. We conclude that the Chinese investors react only partially to the IAS earnings reports, and pay more attention to the PRC GAAP earnings information. Thus, hypothesis H_2 is supported. This result agrees with Chen, Firth and Kim (2002), who reported that investors in the A-share market put more weight on PRC GAAP and started only recently to pay attention to the information based on IAS. There is an interesting result here that the A shares react to the IAS-defined bad news but not to the IAS-defined good news.

6. Summary

We have conducted an event study on the annual earnings announcements based on two different accounting standards, namely, IAS and PRC GAAP, in the Chinese segmented stock market. The annual earnings announcements based on IAS and PRC GAAP are value relevant. Investors in the B-share market react to both the IAS and PRC GAAP annual earnings announcements, while investors in A-share market pay more attention to the PRC GAAP earnings reports. In the B-share market, positive abnormal returns are associated with good-earnings surprises and negative abnormal returns go with bad-earnings surprises. In the A-share market, however, this pattern is not so clear-cut. Negative abnormal returns (though not statistically significant) are observed on the event day when good-earnings surprises are based on IAS. The pre-event abnormal trading volumes without significant price changes for the A-share market suggest some existing information in the A-share market. The post-event abnormal trading volumes persist a longer period in the A-share market than in the B-share market.

Since February 2001, the China Securities Regulatory Commission allowed Chinese citizens to hold and trade both A and B shares. This change eliminates the rigid segmentation between the A- and B-share markets. As our results support the finding that A-share investors have started to pay attention to ISA reports, whether the existing pattern of information values of earnings announcements will change is an interesting question. This will be a challenging topic for future research

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Appendix: Selected firms listed on the SHSE and SZSE included in the event study

The firms in the sample are those that (1) issue both A and B shares, (2) are followed by three or more analysts of IBES, and (3) are publicly traded in the market for more than one year. There are 38 firms in the SHSE and 21 firms in the SZSE

| SHSE | SZSE |
|---|---|
| 1. China First Pencil | 1. Anhui Gujing Distillery |
| 2. China Textile Machinery | 2. Bengang Steel Plates |
| 3. Shanghai Dazhong | 3. Changchai |
| 4. Eastern Communications | 4. China International Marine Containers |
| 5. Heilongjiang Electric Power | 5. China Merchants Shekou |
| 6. Hero (Group) | 6. China Southern Glass Holding |
| 7. Huangshan Tourism | 7. China Vanke |
| 8. Huaxin Cement | 8. Chongqing Changan Automobile |
| 9. Jinzhou Harbor (Group) | 9. Foshan Electrical and Lighting |
| 10. Phoenix | 10. Guangdong Electric Power Development |
| 11. Shanggong | 11. Guangdong Provincial Expressway Development |
| 12. Shanghai Automation Instrumentation | 12. Hubei Sanonda |
| 13. Shanghai Chlor-Alkali Chemical | 13. Konka Group |
| 14. Shanghai Dajiang (Group) | 14. Shenzhen China Bicycle |
| 15. Shanghai Diesel Engine | 15. Shenzhen Chiwan Wharf |
| 16. Shanghai Erfangji | 16. China Fangda Group |
| 17. Shanghai Forever | 17. Shenzhen Nanshan Power Station |
| 18. Shanghai Friendship & Overseas Chinese | 18. Shenzhen Petrochemical Industry (Group) |
| 19. Shanghai Haixin (Group) | 19. Shenzhen Special Economic Zone (Group) |
| 20. Shanghai Jinjiang Tower | 20. Weifu Fuel Injection |
| 21. Shanghai Jinqiao Export Processing Zone Development | 21. Wuxi Little Swan |
| 22. Shanghai Lianhua Fiber | |
| 23. Shanghai Lujiazui Finance & Trade Zone Development | |
| 24. Shanghai Material Trade Center | |
| 25. Shanghai Narcissus Electric Appliance | |
| 26. Shanghai New Asia (Group) | |
| 27. Shanghai Posts & Telecommunications | |
| 28. Shanghai Refrigerator | |
| 29. Shanghai Rubber Belt | |
| 30. Shanghai Sanmao Textile | |
| 31. Shanghai Shangling Electric Appliance | |
| 32. Shanghai Steel Tube | |
| 33. Shanghai Tire & Rubber | |
| 34. Shanghai Vacuum Electron Devices | |
| 35. Shanghai Wing Sung Stationery | |
| 36. Shanghai Worldbest | |
| 37. Shanghai Yaohua Pilkinton Glass | |
| 38. Tianjin Marine Shipping | |

Table 1: Sample size under different levels of earnings surprise based on IAS earnings announcements and PRC GAAP earnings announcements.

For the IAS earnings announcements, the earnings surprise is defined by $ES_i = (AE_i - EE_i) / |EE_i|$, where AE_i is the actual earnings based on IAS reported in the i th event and EE_i is the estimated earnings reported by I/B/E/S. For the PRC GAAP earnings announcements, the earnings surprise is defined by $ES_i = (AE_{it} - AE_{i,t-1}) / |AE_{i,t-1}|$, where $AE_{i,t}$ is the actual annual earnings based on PRC GAAP reported in the i th event and $AE_{i,t-1}$ is the previous year's annual earnings based on PRC GAAP for that company.

| Earnings Surprise (ES) | IAS | PRC GAAP |
|-------------------------------|------------|-----------------|
| ES > 20% | 26 | 19 |
| ES > 0 | 52 | 39 |
| ES < 0 | 97 | 100 |
| ES < -20% | 58 | 69 |

**Table 2: Abnormal return and abnormal trading volume for IAS earnings
(market-model-adjusted abnormal return, earnings surprise exceeding +20%)**

| Event Day | A Shares | | | | B Shares | | | |
|-----------|-----------------|------------------------------------|-------------------------|--|-----------------|------------------------------------|-------------------------|--|
| | Abnormal Return | <i>t</i> -Test for Abnormal Return | Abnormal Trading Volume | <i>t</i> -Test for Abnormal Trading Volume | Abnormal Return | <i>t</i> -Test for Abnormal Return | Abnormal Trading Volume | <i>t</i> -Test for Abnormal Trading Volume |
| -20 | 0.0028 | 0.6946 | 0.2832 | 1.4442 | 0.0004 | 0.0446 | 0.0203 | 0.1038 |
| -19 | 0.0046 | 1.1531 | 0.5097 | 2.5986 | 0.0023 | 0.2595 | -0.0132 | -0.0672 |
| -18 | -0.0077 | -1.9119 | 0.0800 | 0.4079 | -0.0044 | -0.4905 | 0.1168 | 0.5965 |
| -17 | 0.0009 | 0.2184 | 0.2810 | 1.4334 | -0.0079 | -0.8802 | -0.0697 | -0.3554 |
| -16 | -0.0002 | -0.0482 | 0.2959 | 1.5091 | 0.0007 | 0.0793 | 0.1700 | 0.8667 |
| -15 | 0.0022 | 0.5353 | 0.4322 | 2.2042 | 0.0020 | 0.2185 | -0.0232 | -0.1179 |
| -14 | 0.0010 | 0.2564 | 0.6092 | 3.1057 | 0.0086 | 0.9604 | -0.1467 | -0.7478 |
| -13 | 0.0056 | 1.3988 | 0.4454 | 2.2708 | -0.0041 | -0.4571 | -0.0771 | -0.3928 |
| -12 | -0.0066 | -1.6441 | 0.4208 | 2.1444 | -0.0048 | -0.5375 | -0.1518 | -0.7738 |
| -11 | -0.0030 | -0.7423 | 0.5025 | 2.5628 | -0.0042 | -0.4624 | -0.1387 | -0.7069 |
| -10 | -0.0006 | -0.1485 | 0.3222 | 1.6432 | -0.0048 | -0.5328 | 0.1411 | 0.7204 |
| -9 | -0.0038 | -0.9561 | 0.0773 | 0.3943 | 0.0068 | 0.7878 | -0.1970 | -1.0040 |
| -8 | 0.0113 | 2.8064 | 0.4997 | 2.5475 | -0.0070 | -0.7833 | -0.0788 | -0.4019 |
| -7 | -0.0019 | -0.4751 | 0.3099 | 1.5804 | 0.0058 | 0.6435 | -0.1431 | -0.7305 |
| -6 | 0.0023 | 0.5693 | 0.4095 | 2.0876 | 0.0003 | 0.0323 | -0.1571 | -0.8007 |
| -5 | -0.0025 | -0.6254 | 0.5229 | 2.6664 | 0.0071 | 0.7941 | -0.0352 | -0.1791 |
| -4 | -0.0026 | -0.6466 | 0.4923 | 2.5103 | 0.0009 | 0.0965 | 0.0232 | 0.1184 |
| -3 | -0.0043 | -1.0737 | 0.4555 | 2.3221 | 0.0053 | 0.5871 | 0.0406 | 0.2074 |
| -2 | -0.0054 | -1.3472 | 0.6561 | 3.3451 | -0.0039 | -0.4374 | 0.5119 | 2.6101 |
| -1 | 0.0090 | 2.2265 | 1.3304 | 6.7837 | 0.0114 | 1.2651 | 0.7289 | 3.7164 |
| 0 | -0.0022 | -0.5512 | 1.3697 | 6.9836 | 0.0181 | 2.0109 | 0.6579 | 3.3537 |
| 1 | -0.0060 | -1.4938 | 0.8547 | 4.3578 | -0.0081 | -0.8974 | 0.7989 | 4.0739 |
| 2 | -0.0106 | -2.6258 | 0.3821 | 1.9487 | 0.0094 | 1.0481 | 0.6672 | 3.4016 |
| 3 | -0.0050 | -1.2460 | 0.1774 | 0.9041 | -0.0119 | -1.3194 | 0.2412 | 1.2304 |
| 4 | 0.0107 | 2.6664 | 0.3910 | 1.9943 | 0.0015 | 0.1673 | -0.0219 | -0.1123 |
| 5 | -0.0041 | -1.0113 | 0.3254 | 1.6586 | -0.0018 | -0.2049 | 0.3957 | 2.0182 |
| 6 | 0.0064 | 1.5867 | 0.3662 | 1.8674 | -0.0009 | -0.1037 | 0.2004 | 1.0217 |
| 7 | -0.0012 | -0.2878 | 0.2972 | 1.5145 | 0.0017 | 0.1904 | 0.3499 | 1.7837 |
| 8 | 0.0026 | 0.6563 | 0.4662 | 2.3770 | -0.0007 | -0.0719 | 0.1809 | 0.9229 |
| 9 | 0.0060 | 1.4948 | 0.6273 | 3.1994 | 0.0115 | 1.2744 | -0.0095 | -0.0477 |
| 10 | -0.0014 | -0.3401 | 0.5518 | 2.8136 | 0.0012 | 0.1291 | 0.3842 | 1.9589 |

Table 3: Abnormal return and abnormal trading volume for IAS earnings (market-model-adjusted abnormal return, earnings surprise below –20%)

| | A Shares | | | | B Shares | | | |
|-----------|-----------------|----------------------------|-------------------------|------------------------------------|-----------------|----------------------------|-------------------------|------------------------------------|
| Event Day | Abnormal Return | t-Test for Abnormal Return | Abnormal Trading Volume | t-Test for Abnormal Trading Volume | Abnormal Return | t-Test for Abnormal Return | Abnormal Trading Volume | t-Test for Abnormal Trading Volume |
| -20 | 0.0081 | 2.9602 | 0.3473 | 2.5993 | 0.0069 | 1.3565 | 0.2406 | 1.8159 |
| -19 | 0.0024 | 0.8863 | 0.1734 | 1.2974 | 0.0017 | 0.3432 | 0.0292 | 0.2201 |
| -18 | -0.0001 | -0.0538 | 0.0922 | 0.6902 | -0.0023 | -0.4634 | -0.2019 | -1.5236 |
| -17 | -0.0039 | -1.4107 | -0.0642 | -0.4801 | -0.0029 | -0.5748 | -0.0143 | -0.1078 |
| -16 | -0.0015 | -0.5648 | 0.2024 | 1.5146 | -0.0054 | -1.0576 | -0.0229 | -0.1737 |
| -15 | -0.0008 | -0.3033 | 0.2881 | 2.1558 | -0.0036 | -0.7187 | -0.1232 | -0.9304 |
| -14 | -0.0015 | -0.5665 | 0.0517 | 0.3865 | 0.0017 | 0.3320 | -0.0682 | -0.5148 |
| -13 | -0.0013 | -0.4932 | 0.1552 | 1.1608 | -0.0051 | -1.0093 | -0.1332 | -1.0057 |
| -12 | -0.0019 | 0.7084 | 0.2199 | 1.6457 | 0.0087 | 1.7291 | -0.1846 | -1.3927 |
| -11 | 0.0023 | 0.8436 | 0.3806 | 2.8479 | -0.0029 | -0.5822 | -0.2583 | -1.9502 |
| -10 | 0.0008 | 0.2344 | 0.4213 | 3.1528 | -0.0017 | -0.3421 | -0.2075 | -1.5659 |
| -9 | 0.0024 | 0.8935 | 0.3847 | 2.8787 | -0.0009 | -0.1704 | -0.1756 | -1.3264 |
| -8 | 0.0025 | 0.9321 | 0.4533 | 3.3934 | -0.0040 | -0.7918 | 0.0133 | 0.0997 |
| -7 | 0.0024 | 0.8784 | 0.4898 | 3.6654 | -0.0041 | -0.0807 | 0.0962 | 0.7263 |
| -6 | 0.0003 | 0.1089 | 0.6023 | 4.5075 | -0.0087 | -1.7251 | 0.1773 | 1.3376 |
| -5 | -0.0001 | -0.0335 | 0.8258 | 6.1804 | 0.0018 | 0.3458 | 0.2549 | 1.9248 |
| -4 | -0.0055 | -2.0053 | 0.5451 | 4.0787 | -0.0037 | -0.7279 | 0.0887 | 0.6704 |
| -3 | -0.0016 | -0.5771 | 0.7038 | 5.2672 | -0.0058 | -1.1467 | 0.2729 | 2.0614 |
| -2 | -0.0047 | -1.7318 | 0.7901 | 5.9121 | -0.0005 | -0.0941 | 0.1356 | 1.0227 |
| -1 | -0.0022 | -0.8037 | 1.2901 | 9.6543 | -0.0096 | -1.8932 | 0.4943 | 3.7323 |
| 0 | -0.0200 | -7.3328 | 1.0324 | 7.7265 | -0.0146 | -2.8878 | 0.1386 | 1.0468 |
| 1 | -0.0033 | -1.2176 | 1.3035 | 9.7544 | -0.0131 | -2.5842 | 0.3744 | 2.8258 |
| 2 | -0.0044 | -1.6057 | 1.2923 | 9.6709 | -0.0171 | -3.3886 | 0.3983 | 3.0067 |
| 3 | -0.0045 | -1.6637 | 0.9649 | 7.2208 | -0.0055 | -1.0801 | 0.4717 | 3.5607 |
| 4 | -0.0055 | -2.0316 | 0.9249 | 6.9207 | -0.0092 | -1.8144 | 0.2027 | 1.5303 |
| 5 | 0.0032 | 1.1715 | 0.6179 | 4.6239 | -0.0058 | -1.1400 | 0.0549 | 0.4148 |
| 6 | -0.0066 | -2.4285 | 0.4779 | 3.5775 | -0.0024 | -0.4821 | -0.0331 | -0.2504 |
| 7 | -0.0028 | -1.0443 | 0.2928 | 2.1914 | -0.0045 | -0.8845 | 0.0786 | 0.5928 |
| 8 | 0.0011 | 0.4202 | 0.2739 | 2.0504 | 0.0003 | 0.0533 | -0.0924 | -0.6978 |
| 9 | -0.0016 | -0.5750 | 0.3058 | 2.2878 | 0.0010 | 0.2054 | -0.0601 | -0.4533 |
| 10 | 0.0003 | 0.1254 | 0.2482 | 1.8574 | 0.0073 | 1.4402 | -0.1082 | -0.8171 |

Table 4: Abnormal return and abnormal trading volume for PRC GAAP earnings (market-model-adjusted abnormal return, earnings surprise exceeding +20%)

| Event Day | A Shares | | | | B Shares | | | |
|-----------|-----------------|----------------------------|-------------------------|------------------------------------|-----------------|----------------------------|-------------------------|------------------------------------|
| | Abnormal Return | t-Test for Abnormal Return | Abnormal Trading Volume | t-Test for Abnormal Trading Volume | Abnormal Return | t-Test for Abnormal Return | Abnormal Trading Volume | t-Test for Abnormal Trading Volume |
| -20 | 0.0042 | 1.1159 | 0.0703 | 0.4216 | 0.0025 | 0.4675 | 0.3003 | 1.6797 |
| -19 | 0.0011 | 0.2897 | 0.2251 | 1.3507 | 0.0083 | 1.5246 | 0.4258 | 1.2548 |
| -18 | 0.0039 | 1.0363 | 0.1566 | 0.9399 | -0.0035 | -0.6446 | 0.6042 | 1.7635 |
| -17 | -0.0015 | -0.4107 | 0.2258 | 1.3550 | -0.0019 | -0.3469 | 0.3087 | 0.8137 |
| -16 | 0.0010 | 0.2742 | 0.3480 | 2.0882 | 0.0079 | 1.4539 | 0.6609 | 3.3504 |
| -15 | -0.0022 | -0.5822 | 0.7976 | 4.7853 | -0.0020 | -0.3730 | 0.1979 | 0.9690 |
| -14 | 0.0009 | 0.2308 | 0.3889 | 2.3335 | -0.0045 | -0.8365 | 0.1663 | 1.1228 |
| -13 | 0.0061 | 1.6271 | 0.3918 | 2.3510 | -0.0010 | -0.1774 | 0.1694 | 1.1503 |
| -12 | 0.0001 | 0.0371 | 0.8485 | 5.0909 | 0.0066 | 1.2085 | 0.0984 | 0.6351 |
| -11 | 0.0004 | 0.1008 | 0.8325 | 4.9948 | -0.0033 | -0.6105 | 0.0773 | 0.3089 |
| -10 | 0.0039 | 1.0546 | 0.5535 | 3.3208 | -0.0033 | -0.6062 | 0.2905 | 1.4967 |
| -9 | 0.0000 | 0.0052 | 0.4741 | 2.8444 | -0.0011 | -0.2109 | 0.0969 | 0.4680 |
| -8 | 0.0042 | 1.1399 | 0.4800 | 2.8797 | 0.0032 | 0.5968 | -0.0735 | -0.3581 |
| -7 | -0.0009 | -0.2539 | 0.4199 | 2.5196 | -0.0078 | -1.4384 | -0.1035 | -0.4327 |
| -6 | 0.0006 | 0.1521 | 0.4398 | 2.6387 | 0.0027 | 0.4955 | -0.1294 | -0.6143 |
| -5 | 0.0026 | 0.6849 | 0.8431 | 5.0587 | 0.0061 | 1.1186 | 0.0517 | 0.5801 |
| -4 | -0.0051 | -1.3621 | 0.5373 | 3.2240 | -0.0014 | -0.2662 | 0.0232 | 0.4435 |
| -3 | 0.0012 | 0.3350 | 1.0783 | 6.4699 | 0.0054 | 0.9855 | 0.1701 | 0.9642 |
| -2 | 0.0071 | 1.9181 | 0.9822 | 5.8929 | -0.0052 | -0.9628 | 0.6490 | 4.1659 |
| -1 | -0.0013 | -0.3573 | 1.3627 | 8.1762 | -0.0042 | -0.7805 | 1.0965 | 6.9997 |
| 0 | 0.0098 | 2.6292 | 1.6815 | 10.0891 | 0.0158 | 2.9019 | 0.6408 | 3.8883 |
| 1 | 0.0029 | 0.7745 | 1.7555 | 10.5329 | -0.0041 | -0.7603 | 0.9786 | 6.0292 |
| 2 | -0.0107 | -2.8767 | 1.2514 | 7.5085 | -0.0070 | -1.2870 | 0.6544 | 4.0279 |
| 3 | -0.0042 | -1.1193 | 0.7349 | 4.4093 | 0.0071 | 1.3096 | 0.7749 | 4.7843 |
| 4 | -0.0001 | -0.0182 | 0.6982 | 4.1894 | -0.0079 | -1.4460 | 0.0766 | 0.7025 |
| 5 | 0.0098 | 2.6314 | 0.6705 | 4.0230 | -0.0012 | -0.2192 | 0.5011 | 3.0866 |
| 6 | -0.0050 | -1.3455 | 0.7238 | 4.3431 | -0.0124 | -2.2738 | 0.4485 | 2.6632 |
| 7 | 0.0060 | 1.6142 | 1.1153 | 6.6918 | -0.0002 | -0.0457 | 0.4722 | 3.0668 |
| 8 | 0.0018 | 0.4930 | 0.7618 | 4.5710 | 0.0043 | 0.7899 | 0.1644 | 1.2714 |
| 9 | -0.0070 | -1.8696 | 1.3857 | 8.3144 | 0.0058 | 1.0606 | 0.3286 | 2.2168 |
| 10 | -0.0068 | -1.8247 | 0.7044 | 4.2263 | 0.0005 | 0.0922 | 0.4972 | 3.0475 |

Table 5: Abnormal return and abnormal trading volume for PRC GAAP earnings (market-model-adjusted abnormal return, earnings surprise below -20%)

| | A Shares | | | | B Shares | | | |
|-----------|-----------------|----------------------------|-------------------------|------------------------------------|-----------------|----------------------------|-------------------------|------------------------------------|
| Event Day | Abnormal Return | t-Test for Abnormal Return | Abnormal Trading Volume | t-Test for Abnormal Trading Volume | Abnormal Return | t-Test for Abnormal Return | Abnormal Trading Volume | t-Test for Abnormal Trading Volume |
| -20 | 0.0053 | 1.9177 | 0.1152 | 1.0993 | 0.0045 | 1.1980 | 0.2253 | 2.1259 |
| -19 | 0.0013 | 0.4551 | 0.1302 | 1.2418 | 0.0012 | 0.3245 | 0.0646 | 0.6098 |
| -18 | -0.0003 | -0.0936 | -0.0693 | -0.6615 | -0.0017 | -0.4418 | -0.1344 | -1.2684 |
| -17 | -0.0016 | -0.5938 | -0.0165 | -0.1577 | 0.0002 | 0.0439 | -0.0434 | -0.4098 |
| -16 | -0.0023 | -0.8280 | 0.2119 | 2.0216 | -0.0052 | -1.3910 | -0.1085 | -1.0240 |
| -15 | 0.0028 | 1.0283 | 0.2638 | 2.5165 | -0.0011 | -0.3071 | -0.1389 | -1.3107 |
| -14 | -0.0013 | -0.4538 | 0.1050 | 1.0014 | 0.0031 | 0.8232 | -0.0303 | -0.2855 |
| -13 | -0.0010 | -0.3517 | 0.1446 | 1.3797 | 0.0005 | 0.1407 | -0.1726 | -1.6286 |
| -12 | 0.0007 | 0.2450 | 0.2544 | 2.4266 | -0.0011 | -0.3010 | -0.1444 | -1.3627 |
| -11 | 0.0018 | 0.6334 | 0.2466 | 2.3522 | -0.0017 | -0.4416 | -0.1967 | -1.8552 |
| -10 | 0.0044 | 1.5762 | 0.4630 | 4.4164 | -0.0029 | -0.7802 | -0.0870 | -0.8205 |
| -9 | 0.0034 | 1.2329 | 0.3171 | 3.0245 | 0.0026 | 0.7065 | -0.1223 | -1.1536 |
| -8 | 0.0012 | 0.4206 | 0.3649 | 3.4807 | -0.0026 | -0.6903 | -0.0198 | -0.1866 |
| -7 | 0.0031 | 1.1183 | 0.4106 | 3.9172 | -0.0025 | -0.6654 | 0.0894 | 0.8436 |
| -6 | 0.0017 | 0.6000 | 0.5021 | 4.7896 | -0.0022 | -0.5942 | 0.0833 | 0.7858 |
| -5 | 0.0006 | 0.2208 | 0.7402 | 7.0615 | 0.0005 | 0.1460 | 0.2026 | 1.9109 |
| -4 | -0.0060 | -2.1755 | 0.4867 | 4.6429 | -0.0011 | -0.2896 | 0.2262 | 2.1338 |
| -3 | -0.0039 | -1.3936 | 0.4213 | 4.0193 | -0.0073 | -1.9506 | 0.0833 | 0.7856 |
| -2 | 0.0002 | 0.0693 | 0.6469 | 6.1708 | 0.0032 | 0.8483 | 0.1254 | 1.1829 |
| -1 | 0.0013 | 0.4878 | 1.1488 | 10.9586 | -0.0009 | -0.2401 | 0.3749 | 3.5372 |
| 0 | -0.0147 | -5.3135 | 1.1574 | 11.0406 | -0.0087 | -2.3302 | 0.6119 | 5.7730 |
| 1 | -0.0038 | -1.3865 | 1.0761 | 10.2653 | -0.0055 | -1.4844 | 0.5414 | 5.1078 |
| 2 | -0.0008 | -0.3036 | 0.9970 | 9.5112 | -0.0043 | -1.1628 | 0.4254 | 4.0132 |
| 3 | -0.0036 | -1.3034 | 0.7687 | 7.3326 | -0.0099 | -2.6414 | 0.2741 | 2.5861 |
| 4 | -0.0044 | -1.5883 | 0.7715 | 7.3593 | -0.0044 | -1.1797 | 0.3363 | 3.1723 |
| 5 | 0.0006 | 0.2127 | 0.4630 | 4.4168 | -0.0011 | -0.3054 | 0.2592 | 2.4458 |
| 6 | -0.0002 | -0.0736 | 0.3436 | 3.2778 | 0.0037 | 0.9844 | 0.0623 | 0.5878 |
| 7 | -0.0002 | -0.0658 | 0.2953 | 2.8174 | -0.0024 | -0.6448 | 0.0583 | 0.5504 |
| 8 | 0.0017 | 0.6168 | 0.5302 | 5.0579 | 0.0003 | 0.0762 | -0.0445 | -0.4195 |
| 9 | 0.0039 | 1.4089 | 0.8129 | 7.7547 | 0.0023 | 0.6231 | -0.0251 | -0.2365 |
| 10 | -0.0020 | -0.7390 | 1.2172 | 11.6117 | 0.0046 | 1.2250 | 0.0903 | 0.8521 |